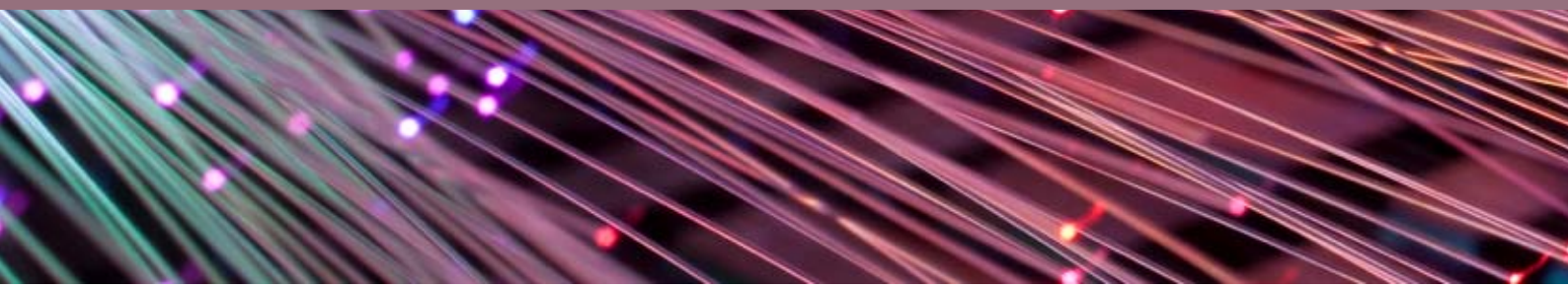
ASX
SETTLEMENT CORPORATION

# Technical Briefing Pack

## ANNI Participant



## Austraclear System Release 3

Aug v3, 2011

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# Introduction

## About this Document

This is the technical briefing paper for the ASX Austraclear Release 3 system, and will supersede the previously published paper once Release 3 is implemented into Production. Its purpose is to assist Participant technology staff in the implementation of the Austraclear Release 3 system. The information in this document applies to Participants who operate in Australia or overseas.

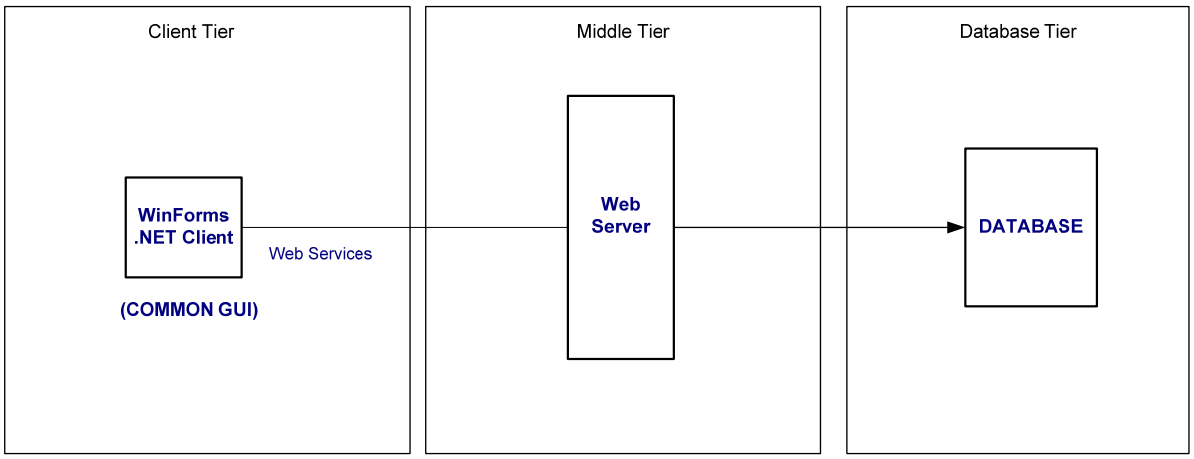
This document does not cover the functionality of the replacement system. For further information regarding the content of this document or the ASX Austraclear system, please send any enquires by email to Exigo@asx.com.au

## Background

The ASX Austraclear system is a next generation Central Securities Depository (CSD) system that utilises an open architecture with a Windows Graphical User Interface (GUI) front end Client. The system's Release 3 provided improvement onto technical requirements and architecture as well as additional and improved functionalities.

The ASX Austraclear system is a .Net Windows Forms application and can be deployed either by browser deployment or file deployment (further information provided in Section 4). The Client application connects to a central web service utilising Microsoft .Net technologies. See Diagram 1 below.

Diagram 1: ASX Austraclear System Architecture Overview

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# Client Workstation Requirements

## Software Requirements

The following table outlines the software requirements for the ASX Austraclear Release 3 system. The Participant is responsible for the supply, installation and support of the required Software, as specified below, and the Hardware required for the Release 3 system.

Table 1: Software Requirements

| Software Requirements | Responsible |
|---|---|
| Microsoft Windows XP Professional Service pack 3<br>Microsoft Windows 7 32-bit or 64-bit | Participant |
| Microsoft Internet Explorer 7.0 or 8.0 | Participant |
| Microsoft .Net Framework version 3.5 Service Pack 1 | Participant |

The Microsoft .Net Framework can be downloaded from the Microsoft web site:
http://www.microsoft.com/downloads/en/resultsForProduct.aspx?displaylang=en&ProductID=de7bb609-3fd0-4b0f-865d-5ed2463ad5d0&nr=10&sortCriteria=Popularity&sortOrder=Ascending&stype=ss_sd

The Microsoft .Net Framework Redistributable package includes everything necessary to run applications developed using the .Net Framework.

You are only required to install the "Redistributable" and NOT the SDK version. This Framework can also be obtained on CD from Microsoft.

Please note that you need to be logged in with Administrator rights to install the Microsoft .Net Framework, as you would normally do when installing operating system software.

Internet Explorer 7.0 or 8.0 can be downloaded from the Microsoft web site:
http://www.microsoft.com/downloads/

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## Hardware Specifications

The minimum recommended PC specification for the ASX Austraclear Release 3 system is shown below. ASX testing has indicated that performance improvements can be realised with increases in processor speed and memory.

Table 2: Recommended Hardware Requirements

| Hardware Requirements | Specifications |
|---|---|
| PC client | Intel Core 2 3.16 GHz<br>(Or AMD equivalent) |
| Memory RAM | 4 GB |
| Monitor & screen resolution | 17" (1024 x 768) |
| Disk space | 30M per Windows user profile |

# Network Infrastructure & Security Requirements

This section outlines minimum Network infrastructure and Security requirements for connecting to the ASX Austraclear Release 3 system.

## Network and Security Requirements

Table 3: Network and Security Requirements – Production

| Requirements | ASX Austraclear | Responsible |
|---|---|---|
| **Network** | | |
| Internet connectivity (256Kbps) * | X | Participant |
| **Security** | | |
| *Firewall ports required to be opened:*<br>• HTTPS (TCP port 443)<br>• DNS (TCP/UDP port 53) | X<br>X | Participant |
| Client Side Digital Certificates | X | Participant |

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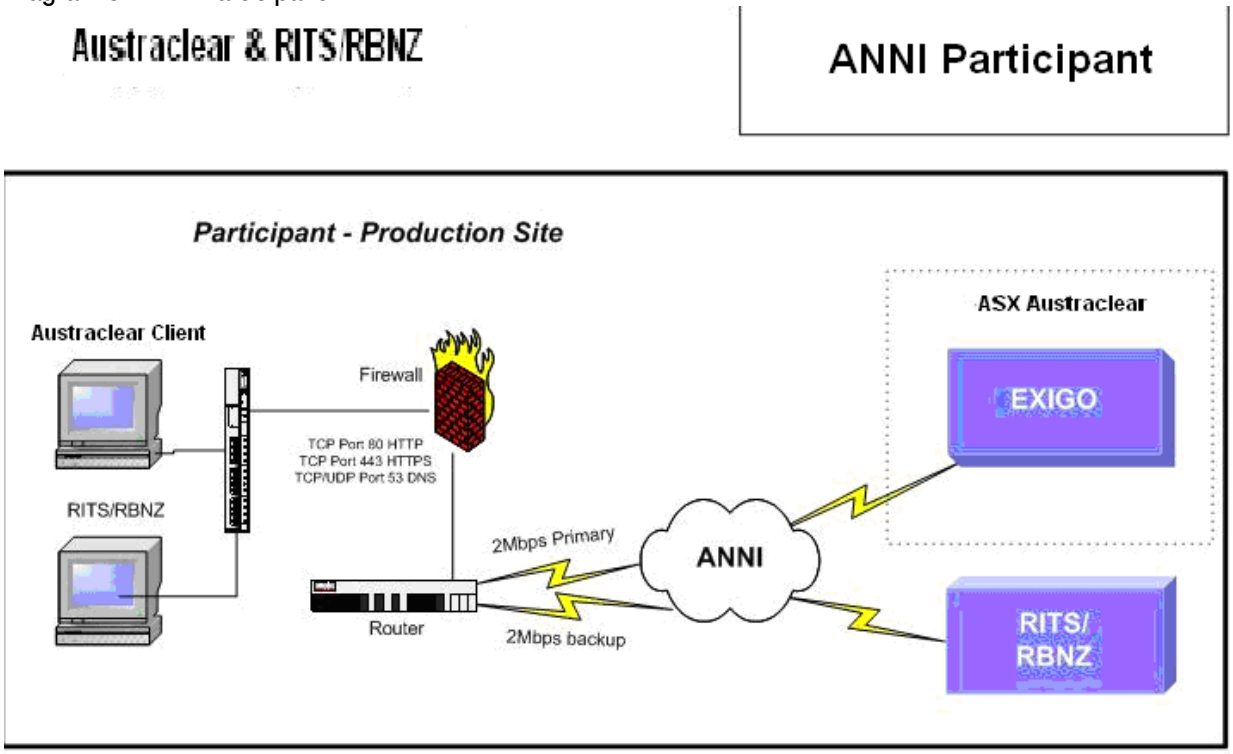
# System Connectivity – Typical Configuration

Diagram 3: ANNI Participant

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# Network Infrastructure

Connectivity for ANNI Participants is currently configured to 2Mbps. Network redundancy is provisioned through the use of a second 2Mbps service.

## Participant Firewalls

Where Participant firewalls are installed, modifications will be required to firewalls in order to communicate successfully with the ASX Austraclear system from the Client Workstation. This information is detailed below in Table 4.

Table 4 - Firewall rules required

ANNI participants should use one of the two methods of name resolution:

**1) Corporate internal DNS servers forwarding requests to the authoritative ANNI DNS server for austraclear.com.au, which is 203.4.179.50. This request must be sent to the ANNI network.**

TABLE 4.1

| Primary Site | | | |
|---|---|---|---|
| Destination | Port(s) | Action | Description |
| 203.4.179.50 | DNS UDP/53 | ALLOW | Allow access to Austraclear DNS systems where required. |

**2) Local hosts files with the entries in Table 4.2 (Refer to Table 6 for further details)**

TABLE 4.2

| Primary Site | | | |
|---|---|---|---|
| Destination | Port(s) | Action | Description |
| 203.4.179.224 | HTTPS TCP/443 | ALLOW | Allow access to the Release 3 Production |
| 203.4.179.228 | HTTPS TCP/443 | ALLOW | Allow access to the Release 3 -Online Help Production environment |
| 203.4.179.230 | HTTPS TCP/443 | ALLOW | Allow access to Release 3 Test Environment |
| 203.4.179.229 | HTTPS TCP/443 | ALLOW | Allow access to the Release 3 Online Help Test environment |

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## Proxy Servers

A proxy server is one which sits between a web browser and another server. It intercepts all requests to the real server to see if it can fulfill the requests itself and if not, forwards the request to the real server. It also can be used to filter requests i.e. to prevent users from accessing a specific web page or sites.

There are two common types of proxy configuration:

- Authenticating
  - Manual – requires all users to authenticate when browsing internet sites
  - Automatic/Integrated – allows users to browse internet sites automatically using a common authentication integrated to each of the user ids.
- Non Authenticating

The ASX Austraclear Release 3 system is designed to work with proxy servers that support HTTP 1.1 (RFC2616)

Please note that the deployment of the ASX Austraclear system differs according to which method of authentication is used. Please see the appropriate user manual for further details. These will be made available on the following ASX Austraclear websites in due course:

1 week prior to IWT:
http://www.asx.com.au/professionals/asx-austraclear-technical-documents.htm

Go Live:
http://www.asx.com.au/professionals/asx-austraclear-technical-documents.htm

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## DNS TCP/IP Configuration

The design of the Austraclear environment makes provision for dynamic failover between Austraclear processing sites for Business Continuity purposes.

It is important that Participants make use of DNS-based name resolution wherever possible. Details are shown in Table 5.

Where DNS-based name resolution is not possible, an alternate mechanism is available to support Business Continuity as specified in Table 6

### Table 5: Application access via DNS

| Application | URL |
|---|---|
| Production | https://asx.austraclear.com.au |
| Online Help | https://asxhelp.austraclear.com.au |
| Test Environment | https://asxta.austraclear.com.au |
| Test Online Help | https://asxhelpta.austraclear.com.au |

Participant DNS systems should resolve all name queries for the austraclear.com.au domain as follows:

- Add DNS forwarding entries for the austraclear.com.au domain to your internal DNS servers to directly resolve the austraclear.com.au domain against the Austraclear DNS servers. The authoritative Austraclear name server is 203.4.179.50 for ANNI participants.
- TTL or Time To Live should be set to recommended setting of 30 seconds.

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In Austraclear Release 2, ANNI participants used the address of 203.18.165.249 to access the system. This address was either configured in their corporate internal DNS or a local host file on the PC. For Austraclear Release 3, ANNI participants can continue to use their corporate internal DNS or the host file but add the entries in table 6. They now also have the option to forward their DNS requests to 203.4.179.50. After Go Live of Austraclear Release 3, the address of 203.18.165.249 will no longer be used.
Where DNS resolution against the authoritative Austraclear name servers is not possible, the following host file entries or static DNS entries should be used:

Table 6: Application access using "Host files" or static DNS entries at Participant sites.

| Application | Host Address | Domain Name |
|---|---|---|
| Production | 203.4.179.224 | asx.austraclear.com.au |
| Online Help | 203.4.179.228 | asxhelp.austraclear.com.au |
| Test Environment | 203.4.179.230 | asxta.austraclear.com.au |
| Test Environment Online Help | 203.4.179.229 | Asxhelpta.austraclear.com.au |

## BCP/DR Scenario (ASX ANNI Router failure)

Although unlikely, in the event of an ANNI access router failure at the ASX Production site, two options are available for participants to continue using the ASX Austraclear system:

1) Connect to the Austraclear system via the internet (authentication via RSA token)
2) Relocate to the Business Continuity Processing / Disaster Recovery site (Some participants will utilise 2Mbps dedicated links to their DR site while others will utilise internet connectivity).

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## BCP/DR Configuration Requirements - Internet

For Participants who prefer to use to access Austraclear Release 3 from their BCP/DR site using Internet connection, the ASX advises a recommended minimum connection speed of 256kbps* for Internet connectivity to the ASX Austraclear Release 3 system.

The following section provides the basic technical requirements to enable Participants to make the appropriate network configuration changes at their BCP/DR site, in order to be able to access the ASX Austraclear Release 3 system via the Internet.

Table 7: Network and Security Requirements – Internet Connection

| Requirements | ASX Austraclear | Responsible |
|---|---|---|
| **Network** | | |
| Internet connectivity (256Kbps) * | X | Participant |
| **Security** | | |
| *Firewall ports required to be opened:*<br>• HTTPS (TCP port 443)<br>• DNS (TCP/UDP port 53) | X<br>X | Participant |
| Client Side Digital Certificates | X | Participant |
| RSA Token | X | Participant |

* The ASX advises a recommended minimum connection speed of 256Kbps per user connectivity for Internet connectivity to the ASX Austraclear Release 3 system.

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## ANNI Participants with Internet Backup

For ANNI participants, **who do use internet connected PC's as a backup** (i.e. PC's not using the ANNI network to connect to Austraclear), it is recommended that these internet PC's resolve using either of the following two methods:

1) Forwarding requests to the authoritative **public** DNS servers for austraclear.com.au, which are ns1.austraclear.com.au (203.18.165.215) and ns2.austraclear.com.au (59.154.35.23). (This is the normal case for ADSL dialup, as the ISP DNS will forward any request to the authoritative name server by default).

2) Local hosts files, with the following entries

203.15.145.75 asx.austraclear.com.au
203.15.145.78 asxhelp.austraclear.com.au
203.15.146.75 asxta.austraclear.com.au
203.15.146.78 asxhelpta.austraclear.com.au

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# Security

Application authentication in the ASX Austraclear Release 3 System is currently controlled through various Security controls, such things as:

- End to end encryption of data between the Client and server using SSL
- Three factor application authentication when connecting over the internet (something you know and something you have)
- Comprehensive password policies
- Automatic application lock for idle users

ASX Austraclear Release 3 system, all users will still be required to both have and know something. This includes the use of an ASX issued Client Side Digital Certificate and a username/password pair for application authentication.

From a security perspective the security controls are related to the application rather than the network. Under ASX Austraclear Release 3 system, there are no changes in the protocols required.

Production (ANNI):

- HTTPS (TCP port 443)
- DNS (TCP/UDP port 53)

BCP/DR (Internet):

- HTTPS (TCP port 443)
- DNS (TCP/UDP port 53)

It should be noted that no connections will be initiated from the ASX network (ANNI) to the Participant site.
As such, Participants should only allow connections to be initiated outbound to ANNI/ASX, with established connections also allowed through firewalls/router access control lists.

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# Deployment of the Client Software

## Deployment Models

The ASX Austraclear Release 3 system is installed as a .Net Windows Forms application. There are two options available to deploy the Client on your desktop workstation.

### Browser Deployment

This model enables a user to deploy the software using their browser via a regular web address (URL). By clicking on the appropriate link on the ASX Austraclear website, the weblauncher is initiated which will carry out the initial download and execution of the application.

This model ensures that each time you initiate the login procedure the web launcher will check for updates to the underlying application. The web launcher Security Policy needs to be installed initially in order to configure the trust relationship between the client and the middle tier.

### File Deployment

This model enables a user to install the ASX Austraclear system on the local PC client. The installation file can be downloaded from the ASX website, and allows the application to be packaged and distributed if necessary.

It will require some intervention on the Participant's part to download and install the most recent version of software periodically. This model is launched from the Start menu or by using a desktop shortcut and doesn't require the use of the browser to execute the system.

## Digital Certificates

Users of the ASX Austraclear system will be required to enrol in the ASX controlled Certificate Authority (CA). Once the user has been validated, a certificate will be issued and downloaded into the user's Web browser. This certificate will be exportable. (E.g. installed at a Participant BCP/DR site).

Use of this exportable capability is a security policy decision owned by the Participant. ASX does not take responsibility for the management of the certificate and authentication process within a Participant's operations.

When logging into the application, a valid certificate and username and password pair will need to be presented to the application. Without these items a user will not be able to login.

Please see the Technical FAQ's for further details regarding digital certificates.

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# PC Setup for IWT and Go-Live

ASX Austraclear recommends use of PCs that are separate to the current Production environment, for testing during IWT which would then become the new Production PCs at go-live. This approach will minimize any impacts to existing Production PC's used for current Release 2.

However, if necessary and while not recommended, participants can set up existing production PCs to also be used for Release 3 IWT (and therefore go-live). Participants must note that running both Release 2 and 3 GUI's on the same PC during IWT poses an operational risk to the user.

To mitigate this risk, the Release 3 GUI during IWT will be coloured yellow to assist users in differentiating the versions. The Release 3 GUI will automatically revert to the standard grey colour at go-live. Using the same PC for Release 2 and 3 may also pose a technical risk if any installation delays are experienced during deployment by participant's internal IT.

Additional set up is required if this approach is to be taken, the details of which are provided below.

1) install .net to a version that meets the software requirements listed in Table 1, along side the existing install of .net 1.1 service pack 1 (ie. .net 1.1 service pack 1 must not be removed)

2) upgrade Internet Explorer to a version that meets the software requirements listed in Table 1.

3) If the XP machine is not automatically patched by Windows Root Certificate Updates, then a root certificate must be installed called "VeriSign Class 3 Public Primary Certification Authority - G5".
(Current Release 2 uses the root certificate called "Class 3 Public Primary Certification Authority"). Windows 7 PC's should already have this root certificate installed as default. This certificate can be downloaded from Verisign at http://www.verisign.com/support/roots.html

4) For Browser deployment users (Users who click on the web link to launch the GUI), the new updated version of Weblauncher (WeblauncherInstaller_R1394.msi) must be installed along side the existing version of Weblauncher (WebLauncherInstaller_V18.msi). Both versions can coexist on the same PC. However, please note that clicking on the new link to launch the Release 3 GUI, will overwrite the Release 2 GUI in the user's windows profile space. Vice versa, clicking on the current link to launch the Release 2 GUI, will overwrite the Release 3 GUI. This means that every time the user switches between Release 2 and 3 GUI's, they will be required to download the GUI again. However, both GUI's can be used side by side, after the download.
For File deployment users, both Release 2 and 3 GUI's can be installed side by side on the same PC. Both can be launched and used at the same time.

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# Deployment and user guides

All the relevant documentation and user guides relating to the deployment and installation of both the ASX Austraclear system and the related Digital Certificates will be available on the ASX Austraclear websites in due course:

1 week prior to IWT
http://www.asx.com.au/professionals/asx-austraclear-technical-documents.htm

Go-Live
http://www.asx.com.au/professionals/asx-austraclear-technical-documents.htm

# Frequently Asked Questions

An FAQ register is available on the Austraclear Website in the Business Section and is updated regularly.

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# Glossary

| Term | Definition | Meaning |
|---|---|---|
| ANNI | Austraclear National Network Infrastructure | The network, supported by the ASX that provides access to the Austraclear, RITS & ACNZ systems |
| Authentication | Login process | Establishes the credentials of a user as an "authorised" user |
| .Net | .Net Framework | Server based technology designed to provide web based services with minimal need for manual software installation on the desktop.<br>For more details see http://www.microsoft.com/net |
| Data Encryption | Data Encryption | The process by which data is temporarily re-arranged into an unreadable or unintelligible form for confidentiality, transmission, or other security purposes |
| Digital Certificates | Digital Certificates | A Digital Certificate is the electronic version of an ID card that establishes your credentials and authenticates your connection when performing transactions over the Internet |
| DNS | Domain Name System | The Domain Name System is the system that translates Internet *domain names* into *IP numbers*. A "DNS Server" is a *server* that performs this kind of translation. |
| GUI | Graphical User Interface | The part of the application with which the user interacts. Windows applications interact graphically |
| HTML | Hyper Text Markup Language | The language used to create Web pages and read by a browser. |
| HTTP | Hyper Text Transfer Protocol | The protocol used for Internet HTML web pages |
| HTTPS | Hyper Text Transfer Protocol Secure | The protocol used for Secure Internet HTML web pages |
| Internet Explorer | Internet Explorer | Software provided by Microsoft used to browse the Internet. Used to view and interact with HTML pages. |
| RITS | Reserve Bank Information & Transfer System | A simultaneous electronic transfer and settlement system for Commonwealth Government Securities. This facility has now been largely transferred to the Austraclear system |
| SSL | Secure Sockets layer | This is an industry wide standard for encrypting data securely across the Internet via the HTTP and HTTPS protocols. |
| Three-Factor Authentication | Three-Factor Authentication | Three-Factor authentication is based on something you know (a password or PIN), and something you have (an authenticator) an RSA token – providing a much more reliable level of user authentication than a reusable password. The 3 factors are Username & password, digital certificate and RSA token |
| TTL | Time To Live | TTL is set by an authoritative name server for a particular resource record. When a caching name server queries the authoritative name server for a resource record, it will cache that record for the defined period (in seconds) set as a TTL, |
| URL | Universal Resource Locater | An address for a resource available on the Internet eg www.asx.com.au |
| Security Policy | Security Policy | This file was provided by the vendor to ensure that assemblies are secure when downloaded. This file also gives access to run the program. The security policy file will be delivered as MSI (Microsoft Installer) once downloaded (for browser deployment only.). |

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